

What Is Claimed Is:

1 1. A static attitude measurement device for measuring the static
2 attitude of a head suspension target while reducing measurement errors due to stray
3 spots and internal reflections, the device comprising:
4 a light source for producing a light beam;
5 a beam splitter for directing a first portion of the light beam
6 toward a target from which a reflected beam is returned;
7 a detector for detecting the reflected beam at a predetermined
8 polarization state; and
9 a polarization component for producing the predetermined
10 polarization state in the reflected beam, the polarization component positioned
11 between the beam splitter and the target.

1 2. The measurement device of claim 1, wherein the polarization
2 component comprises a quarter-wave plate.

1 3. The measurement device of claim 2, wherein the beam
2 splitter comprises a first beam splitter and the device further comprises a second
3 beam splitter positioned between the light source and the first beam splitter.

1 4. The measurement device of claim 3, wherein the second
2 beam splitter comprises a polarizing beam splitter.

1 5. The measurement device of claim 3, wherein the first beam
2 splitter comprises a polarizing beam splitter.

1 6. The measurement device of claim 3, further comprising a
2 polarizer positioned between the first and second beam splitters.

1 7. The measurement device of claim 6, further comprising a
2 beam reducer positioned between the first beam splitter and the polarizer.

1 8. The measurement device of claim 1, further comprising
2 collection optics positioned between the beam splitter and the quarter-wave plate,
3 the collection optics including at least one lens for focusing the first portion of the
4 beam.

1 9. The measurement device of claim 1, wherein the beam
2 splitter is positioned between the target and the detector.

1 10. The measurement device of claim 1, wherein the static
2 attitude measurement device also measures Z-height of the target and wherein the
3 device further comprises:
4 a Z-height detector for detecting a Z-height reflected beam;
5 and
6 a Z-height directional component for directing a second
7 portion of the light beam toward the target from which the reflected beam from the
8 target is directed toward the Z-height detector.

1 11. The measurement device of claim 10, further comprising a
2 polarization component positioned between the Z-height directional component
3 and the target for changing the polarization state of the second portion of the light
4 beam prior to encountering the target.

1 12. The measurement device of claim 1, wherein the light source
2 comprises a polarized laser.

1 13. The measurement device of claim 1, wherein the detector
2 comprises a polarizer that passes substantially only light in the predetermined
3 polarization state.

1 14. A method for measuring the static attitude of a head
2 suspension target while reducing measurement errors due to stray spots and
3 internal reflections, the method comprising the steps of:
4 providing a light beam;
5 directing the beam onto a target from which a reflected beam
6 is returned;
7 producing a predetermined polarization state in the reflected
8 beam by passing the beam and the reflected beam through a first polarization
9 component; and
10 detecting the reflected beam at the predetermined
11 polarization state.

1 15. The method of claim 14, wherein the step of detecting
2 comprises providing a detector that detects the reflected beam at the predetermined
3 polarization state and providing a polarizer that passes substantially only light in
4 the predetermined polarization state.

1 16. The method of claim 14, wherein the first polarization
2 component comprises a quarter-wave plate through which the beam and reflected
3 beam are passed to produce a predetermined polarization state in the reflected
4 beam that is orthogonally polarized with respect to a polarization state of the beam.

1 17. The method of claim 14, wherein the step of directing
2 comprises passing the beam through a beam splitter before encountering the target.

1 18. The method of claim 17, wherein the beam splitter comprises
2 a polarizing beam splitter which passes substantially only light in the
3 predetermined polarization state and reflects substantially all other light.

1 19. The method of claim 17, further comprising passing the beam
2 through a polarizer positioned before beam splitter to substantially block light at
3 undesired polarization states.

1 20. The method of claim 14, wherein the method is also for
2 measuring the Z-height of the target, and wherein the method further comprises
3 directing a portion of the beam onto the target from which a reflected Z-height
4 beam is returned and detecting the reflected Z-height beam to determine the Z-
5 height of the target.

1 21. The method of claim 20, further comprising the step of
2 producing a desired polarization state in the reflected Z-height beam such that any
3 reflected Z-height beam directed toward the detector for the static attitude
4 measurement is not in the predetermined polarization state.

1 22. The method of claim 21, wherein the step of producing
2 comprises passing the portion of the beam through a second polarization
3 component before the portion of the beam encounters the target, such that any
4 portion of the reflected Z-height beam directed toward the detector for the static
5 attitude measurement also passes through the first polarization component
6 producing a polarization state in the reflected Z-height beam that is substantially
7 not the predetermined polarization state.

1 23. In a static attitude measurement device for measuring the
2 static attitude of a head suspension target, the device including a light source for
3 producing a light beam, first and second beam splitters for directing the light beam
4 toward the target from which a reflected beam is returned, and a detector for
5 detecting light at substantially only a predetermined polarization state with the
6 detector positioned to intercept the reflected beam, the improvement comprising a
7 quarter-wave plate positioned between the second beam splitter and the target for
8 producing the predetermined polarization state in the reflected beam.

1 24. The improvement of claim 23, further comprising a polarizer
2 positioned between the first and second beam splitters for reducing light in an
3 unwanted polarization state from reaching the quarter-wave plate and the target.

1 25. In a combined static attitude and Z-height measurement
2 device for measuring the static attitude and Z-height of a head suspension target,
3 the device including a light source for producing a light beam, a first beam splitter
4 for producing first and second portions of the light beam, a second beam splitter
5 for directing the first portion of the light beam toward the target from which a
6 static attitude reflected beam is returned, a first detector for detecting light at
7 substantially only a predetermined polarization state with the detector positioned to
8 intercept the static attitude reflected beam, at least one directional component for
9 directing the second portion of the light beam toward the target from which a Z-
10 height reflected beam is returned and a second detector positioned to intercept and
11 detect the Z-height reflected beam, the improvement comprising:

12 a first quarter-wave plate positioned between the second
13 beam splitter and the target for producing the predetermined polarization state in
14 the static attitude reflected beam; and

15 a second quarter-wave plate positioned before the target for

16 producing a desired polarization state in the second portion of the light beam
17 before it encounters the target.

1 26. The improvement of claim 25, further comprising a polarizer
2 positioned between the first and second beam splitters for reducing light in an
3 unwanted polarization state from reaching the first quarter-wave plate and the
4 target.